查询12F(R) SERIES供应商

Bulletin I20205 rev. A 09/98

International
IOR Rectifier

# 12F(R) SERIES

**STANDARD RECOVERY DIODES** **Stud Version**

12 A

## Features

- High surge current capability
- Avalanche types available
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200V $V_{RRM}$

## TypicalApplications

- Battery charges
- Converters
- Power supplies
- Machine tool controls

## Major Ratings and Characteristics

| Parameters | | 12F(R) | Units |
|---|---|---|---|
| $I_{F(AV)}$ | | 12 | A |
| | @ $T_C$ | 144 | °C |
| $I_{F(RMS)}$ | | 19 | A |
| $I_{FSM}$ | @ 50Hz | 265 | A |
| | @ 60Hz | 280 | A |
| $I^2t$ | @ 50Hz | 351 | $A^2s$ |
| | @ 60Hz | 320 | $A^2s$ |
| $V_{RRM}$ | range | 100 to 1200 | V |
| $T_J$ | range | - 65 to 175 | °C |

case style
DO-203AA (DO-4)

## ELECTRICAL SPECIFICATIONS

### Voltage Ratings

| Type number | Voltage Code | $V_{RRM}$, maximum repetitive peak reverse voltage V | $V_{RSM}$, maximum non-repetitive peak reverse voltage V | $V_{R(BR)}$, minimum avalanche voltage V **(1)** | $I_{RRM}$ max. @ $T_J$ = 175°C mA |
|---|---|---|---|---|---|
| 12F(R) | 10 | 100 | 150 | -- | 12 |
| | 20 | 200 | 275 | -- | |
| | 40 | 400 | 500 | 500 | |
| | 60 | 600 | 725 | 750 | |
| | 80 | 800 | 950 | 950 | |
| | 100 | 1000 | 1200 | 1150 | |
| | 120 | 1200 | 1400 | 1350 | |

**(1)** Avalanche version only available from $V_{RRM}$ 400V to 1200V.

### Forward Conduction

| | Parameter | 12F(R) | Units | Conditions | | |
|---|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. average forward current | 12 | A | 180° conduction, half sine wave | | |
| | @ Case temperature | 144 | °C | | | |
| $I_{F(RMS)}$ | Max. RMS forward current | 19 | A | | | |
| $P_R$ | Maximum non-repetitive peak reverse power | 7 | K/W | 10µs square pulse, $T_J = T_J$ max. **see note (2)** | | |
| $I_{FSM}$ | Max. peak, one-cycle forward, non-repetitive surge current | 265 | A | t = 10ms | No voltage reapplied | Sinusoidal half wave, Initial $T_J = T_J$ max. |
| | | 280 | | t = 8.3ms | | |
| | | 225 | | t = 10ms | 100% $V_{RRM}$ reapplied | |
| | | 235 | | t = 8.3ms | | |
| $I^2t$ | Maximum $I^2t$ for fusing | 351 | $A^2s$ | t = 10ms | No voltage reapplied | |
| | | 320 | | t = 8.3ms | | |
| | | 250 | | t = 10ms | 100% $V_{RRM}$ reapplied | |
| | | 226 | | t = 8.3ms | | |
| $I^2\sqrt{t}$ | Maximum $I^2\sqrt{t}$ for fusing | 3510 | $A^2\sqrt{s}$ | t = 0.1 to 10ms, no voltage reapplied | | |
| $V_{F(TO)1}$ | Low level value of threshold voltage | 0.77 | V | (16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $V_{F(TO)2}$ | High level value of threshold voltage | 0.97 | | (I > π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $r_{f1}$ | Low level value of forward slope resistance | 10.70 | mΩ | (16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $r_{f2}$ | High level value of forward slope resistance | 6.20 | | (I > π x $I_{F(AV)}$), $T_J = T_J$ max. | | |
| $V_{FM}$ | Max. forward voltage drop | 1.26 | V | $I_{pk}$= 38A, $T_J$ = 25°C, $t_p$ = 400µs rectangular wave | | |

**(2)** Available only for Avalanche version, all other parameters the same as 12F.

## Thermal and Mechanical Specifications

| | Parameter | 12F(R) | Units | Conditions |
|---|---|---|---|---|
| $T_J$ | Max. junction operating temperature range | -65 to 175 | °C | |
| $T_{stg}$ | Max. storage temperature range | -65 to 200 | | |
| $R_{thJC}$ | Max. thermal resistance, junction to case | 2 | K/W | DC operation |
| $R_{thCS}$ | Max. thermal resistance, case to heatsink | 0.5 | | Mounting surface, smooth, flat and greased |
| T | Mounting torque, ± 10% | 1.2<br>(1.5) | Nm | Lubricated threads<br>(Not lubricated threads) |
| wt | Approximate weight | 7 (0.25) | g (oz) | |
| | Case style | DO-203AA (DO-4) | | See Outline Table |

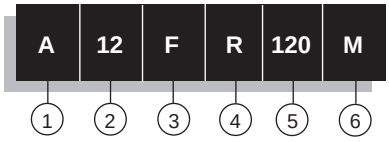
## $\Delta R_{thJC}$ Conduction

(The following table shows the increment of thermal resistence $R_{thJC}$ when devices operate at different conduction angles than DC)

| Conduction angle | Sinusoidal conduction | Rectangular conduction | Units | Conditions |
|---|---|---|---|---|
| 180° | 0.33 | 0.26 | K/W | $T_J = T_J$ max. |
| 120° | 0.41 | 0.44 | | |
| 90° | 0.53 | 0.58 | | |
| 60° | 0.78 | 0.81 | | |
| 30° | 1.28 | 1.29 | | |

## Ordering Information Table

**Device Code**




**1** - A = Avalanche diode
None = Standard diode

**2** - Current rating: Code = $I_{F(AV)}$

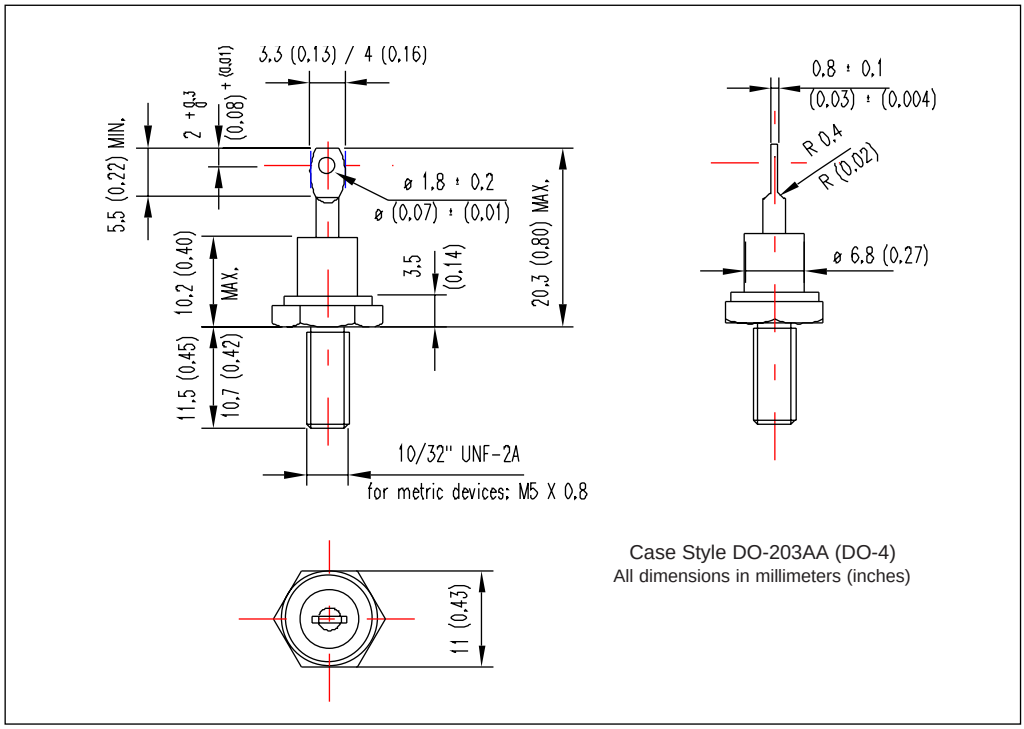
**3** - F = Standard device

**4** - None = Stud Normal Polarity (Cathode to Stud)
R = Stud Reverse Polarity (Anode to Stud)

**5** - Voltage code: Code x 10 = $V_{RRM}$ (See Voltage Ratings table)

**6** - None = Stud base DO-203AA (DO-4) 10-32UNF-2A
M = Stud base DO-203AA (DO-4) M5 X 0.8 - (Not available for Avalanche diodes)

Outlines Table




Case Style DO-203AA (DO-4)
All dimensions in millimeters (inches)

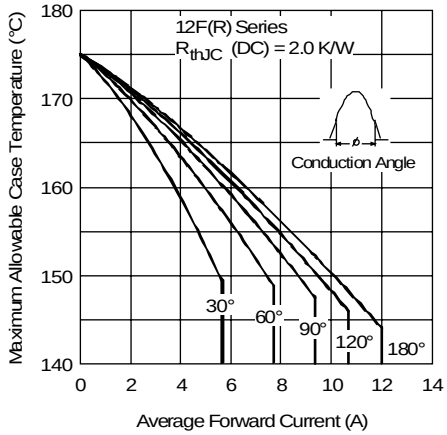



Fig. 1 - Current Ratings Characteristics

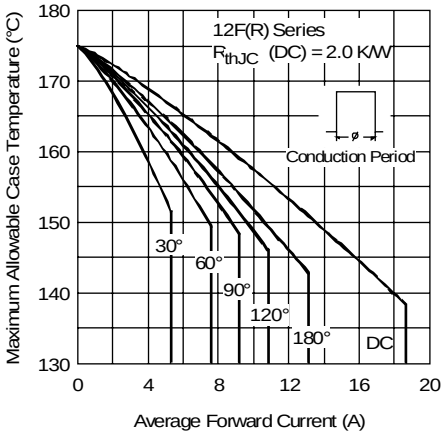



Fig. 2 - Current Ratings Characteristics

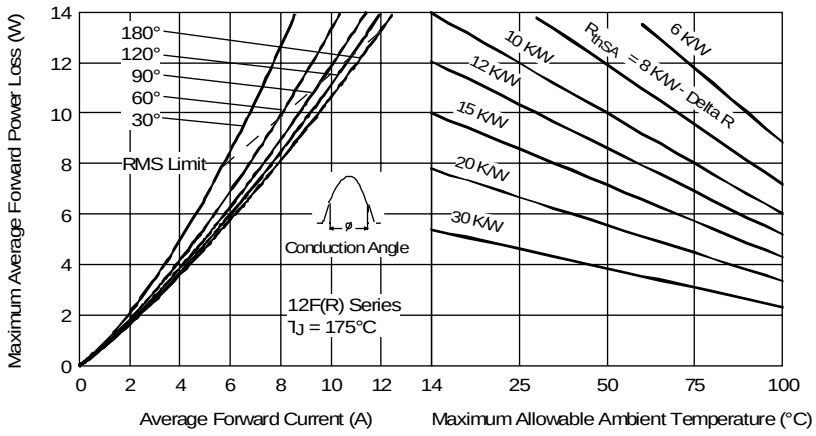



Fig. 3 - Forward Power Loss Characteristics

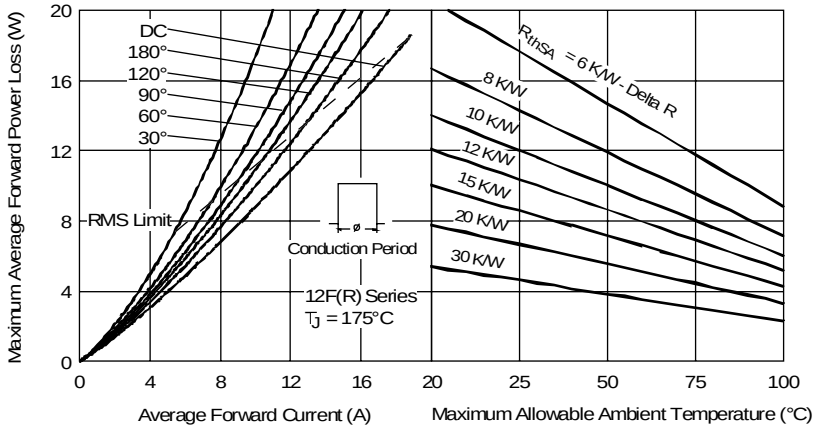



Fig. 4 - Forward Power Loss Characteristics

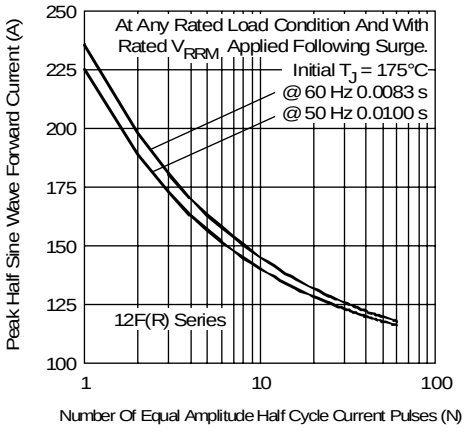

Peak Half Sine Wave Forward Current (A)
At Any Rated Load Condition And With
Rated VRRM Applied Following Surge.
Initial TJ = 175°C
@ 60 Hz 0.0083 s
@ 50 Hz 0.0100 s
12F(R) Series
Number Of Equal Amplitude Half Cycle Current Pulses (N)

Fig. 5 - Maximum Non-Repetitive Surge Current

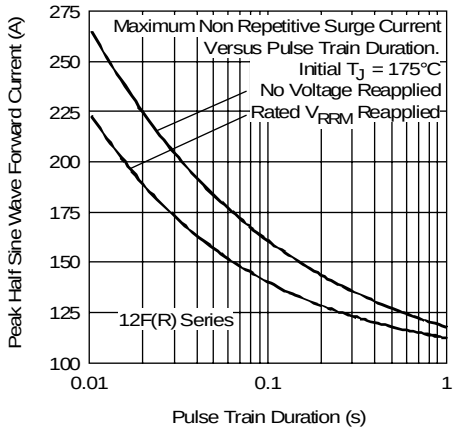

Peak Half Sine Wave Forward Current (A)
Maximum Non Repetitive Surge Current
Versus Pulse Train Duration.
Initial TJ = 175°C
No Voltage Reapplied
Rated VRRM Reapplied
12F(R) Series
Pulse Train Duration (s)

Fig. 6 - Maximum Non-Repetitive Surge Current

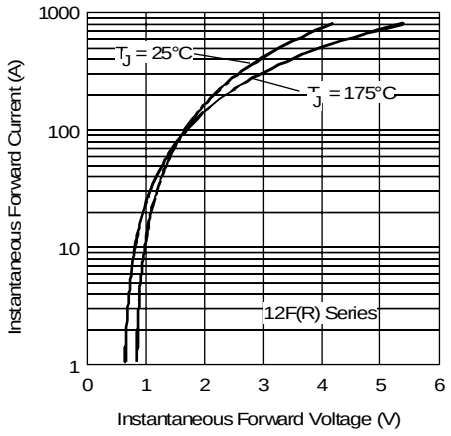



Fig. 7 - Forward Voltage Drop Characteristics

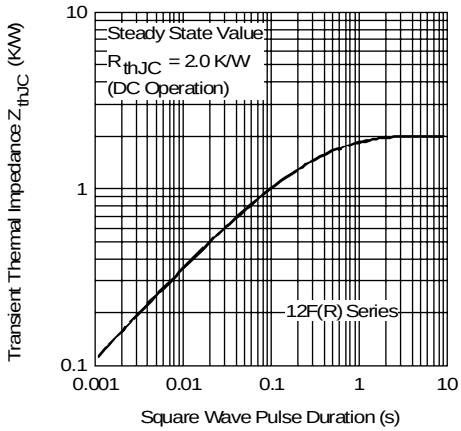



Fig. 8 - Thermal Impedance $Z_{thJC}$ Characteristics

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*Data and specifications subject to change without notice.*